SEQUENCE LISTING

<110> Bruce D. Weintraub Mariusz W. Szkudlinski University of Maryland <120> CYSTINE KNOT GROWTH FACTOR MUTANTS <130> UOFMD.003C1 <150> PCT/US99/05908 <151> 1999-03-19 <150> PCT/US98/19772 <151> 1998-09-22 <160> 41 <170> FastSEQ for Windows Version 4.0 <210> 1 <211> 93 <212> PRT <213> HOMO SAPIEN Ш <400> 1 Pro Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Ϋ́ 10 Pro Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met 40 Leu Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His 70 ¼ Thr Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser 85 <210> 2 <211> 119 <212> PRT <213> HOMO SAPIEN <400> 2 Pro Phe Cys Ile Pro Thr Glu Tyr Thr Met His Ile Glu Arg Arg Glu 10 Cys Ala Tyr Cys Leu Thr Ile Asn Thr Thr Ile Cys Ala Gly Tyr Cys 25 Met Thr Arg Asp Ile Asn Gly Lys Leu Phe Leu Pro Lys Tyr Ala Leu 40 Ser Gln Asp Val Cys Thr Tyr Arg Asp Phe Ile Tyr Arg Thr Val Glu 55

Ile Pro Gly Cys Pro Leu His Val Ala Pro Tyr Phe Ser Tyr Pro Val

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75
   Ala Leu Ser Cys Lys Cys Gly Lys Cys Asn Thr Asp Tyr Ser Asp Cys
   Ile His Glu Ala Ile Lys Thr Asn Tyr Cys Thr Lys Pro Gln Lys Ser
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                                   105
   Tyr Leu Val Gly Phe Ser Val
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   Leu Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr
   Thr Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly
                               40
   Val Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg
🗐 Phe Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val
                       70
🛀 Val Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg
                   85
                                       90
   Ser Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp
                                   105
   Asp Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser
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   Leu Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr
   Thr Ile Cys Ala Gly Tyr Cys Pro Thr Met Met Arg Val Leu Gln Ala
   Val Leu Pro Pro Leu Pro Gln Val Val Cys Thr Tyr Arg Asp Val Arg
                           55
   Phe Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asp Pro Val
                       70
   Val Ser Phe Pro Val Ala Leu Ser Cys Arg Cys Gly Pro Cys Arg Arg
   Ser Thr Ser Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp
                                   105
   His Pro Gln Leu Ser Gly Leu Leu Phe Leu
           115
                               120
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   Pro Asn Ser Cys Glu Leu Thr Asn Ile Thr Ile Ala Ile Glu Lys Glu
   Glu Cys Arg Phe Cys Ile Ser Ile Asn Thr Thr Trp Cys Ala Gly Tyr
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                                   25
   Cys Tyr Thr Arg Asp Leu Val Tyr Lys Asp Pro Ala Arg Pro Lys Ile
                               40
   Thr Cys Thr Phe Lys Glu Leu Val Tyr Glu Thr Val Arg Val Pro Gly
                           55
   Cys Ala His His Ala Asp Ser Leu Tyr Thr Tyr Pro Val Ala Thr Gln
                                            75
   Cys His Cys Gly Lys Cys Asp Ser Asp Ser Thr Asp Cys Thr Val Arg
                   85
                                       90
   Gly Leu Gly Pro Ser Tyr Cys Ser Phe Gly Glu Met Lys Glu
                                    105
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   <211> 126
   <212> PRT
   <213> HOMO SAPIEN
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   <400> 6
  Pro Ser Ile Glu Glu Ala Val Pro Ala Val Cys Lys Thr Arg Thr Val
   Ile Tyr Glu Ile Pro Arg Ser Gln Val Asp Pro Thr Ser Ala Asn Phe
               20
                                    25
   Leu Ile Trp Pro Pro Cys Val Glu Val Lys Arg Cys Thr Gly Cys Cys
   Asn Thr Ser Ser Val Lys Cys Gln Pro Ser Arg Val His His Arg Ser
                            55
  Val Lys Val Ala Lys Val Glu Tyr Val Arg Lys Lys Pro Lys Leu Lys
                       70
   Glu Val Gln Val Arg Leu Glu Glu His Leu Glu Cys Ala Cys Ala Thr
                   85
                                        90
   Thr Ser Leu Asn Pro Asp Tyr Arg Glu Glu Asp Thr Gly Arg Pro Arg
                                   105
   Glu Ser Gly Lys Lys Arg Lys Arg Lys Arg Leu Lys Pro Thr
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                               120
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   Cys Lys Thr Arg Thr Glu Val Phe Glu Ile Ser Arg Arg Leu Ile Asp
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Arg Thr Asn Ala Asn Phe Leu Val Trp Pro Pro Cys Val Glu Val Gln
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Arg Cys Ser Gly Cys Cys Asn Asn Arg Asn Val Gln Cys Arg Pro Thr
                       55
Gln Val Gln Leu Arg Pro Val Gln Val Arg Lys Ile Glu Ile Val Arg
Lys Lys Pro Ile Phe Lys Lys Ala Thr Val Thr Leu Glu Asp His Leu
                                   90
Ala Cys Lys Cys Glu Thr Val Ala Ala Arg Pro Val Thr Arg Ser
           100
                               105
Pro Gly Gly Ser Gln Glu Gln Arg Ala Lys Thr Pro Gln Thr Arg Val
                           120
Thr Ile Arg Thr Val Arg Val Arg Pro Pro Lys Gly Lys His Arg
                       135
Lys Phe Lys His Thr His Asp Lys Thr Ala Leu Lys Glu Thr Leu Gly
Ala
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Lys Phe Met Asp Val Tyr Gln Arg Ser Tyr Cys His Pro Ile Glu Thr
Leu Val Asp Ile Phe Gln Glu Tyr Pro Asp Glu Ile Glu Tyr Ile Phe
                            40
Lys Pro Ser Cys Val Pro Leu Met Arg Cys Gly Gly Cys Cys Asn Asp
                        55
Glu Gly Leu Glu Cys Val Pro Thr Glu Glu Ser Asn Ile Thr Met Gln
                    70
                                        75
Ile Met Arg Ile Lys Pro His Gln Gly Gln His Ile Gly Glu Met Ser
Phe Leu Gln His Asn Lys Cys Glu Cys Arg Pro Lys Lys Asp Arg Ala
            100
                                105
Arg Gln Glu Lys Lys Ser Val Arg Gly Lys Gly Lys Gly Gln Lys Arg
                            120
Lys Arg Lys Lys Ser Arg Tyr Lys Ser Trp Ser Val Pro Cys Gly Pro
                        135
                                            140
Cys Ser Glu Arg Arg Lys His Leu Phe Val Gln Asp Pro Gln Thr Cys
                    150
                                        155
Lys Cys Ser Cys Lys Asn Thr Asp Ser Arg Cys Lys Ala Arg Gln Leu
                165
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Glu Leu Asn Glu Arg Thr Cys Arg Cys Asp Lys Pro Arg Arg
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<211> 121

<212> PRT

<213> HOMO SAPIEN

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   Asp Ser Val Ser Val Trp Val Gly Asp Lys Thr Thr Ala Thr Asp Ile
   Lys Gly Lys Glu Val Met Val Leu Gly Glu Val Asn Asn Ile Asn Ser
   Val Phe Lys Gln Tyr Phe Phe Glu Thr Lys Cys Arg Asp Pro Asn Pro
                           55
   Val Asp Ser Gly Cys Arg Gly Ile Asp Ser Lys His Trp Asn Ser Tyr
                       70
                                           75
   Cys Thr Thr His Thr Phe Val Lys Ala Met Leu Thr Asp Gly Lys
                                       90
   Gln Ala Ala Trp Arg Phe Ile Arg Ile Asp Thr Ala Cys Val Cys Val
               100
                                   105
   Leu Ser Arg Lys Ala Val Arg Arg Ala
           115
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  Pro His Ser Asp Pro Ala Arg Arg Gly Glu Leu Ser Val Cys Asp Ser
  Ile Ser Glu Trp Val Thr Ala Ala Asp Lys Lys Thr Ala Val Asp Met
  Ser Gly Gly Thr Val Thr Val Leu Glu Lys Val Ser Pro Val Lys Gly
  Gln Leu Lys Gln Tyr Phe Tyr Glu Thr Lys Cys Asn Pro Met Gly Tyr
                           55
  Thr Lys Glu Gly Cys Arg Gly Ile Asp Lys Arg His Trp Asn Ser Gln
ľU 65
🖸 Cys Arg Thr Thr Gln Ser Tyr Val Arg Ala Met Leu Thr Asp Ser Lys
                   85
                                       90
🚣 Lys Arg Ile Gly Trp Arg Phe Ile Arg Ile Asp Thr Ser Cys Val Cys
               100
                                   105
   Ile Leu Thr Ile Lys Arg Gly Arg
           115
   <210> 11
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   <400> 11
   Pro Tyr Ala Glu His Lys Ser His Arg Gly Glu Tyr Ser Val Cys Asp
   Ser Glu Ser Leu Trp Val Thr Asp Lys Ser Ser Ala Ile Asp Ile Arg
   Gly His Gln Val Thr Val Leu Gly Glu Ile Gly Lys Thr Asn Ser Pro
                               40
   Val Lys Gln Tyr Phe Tyr Glu Thr Arg Cys Lys Glu Ala Arg Pro Val
```

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55
Lys Asn Gly Cys Arg Gly Ile Asp Asp Arg His Trp Asn Ser Gln Cys
Lys Thr Ser Gln Thr Tyr Val Arg Ala Ser Leu Thr Glu Asn Asn Lys
Leu Val Gly Trp Arg Trp Ile Arg Ile Asp Thr Ser Cys Val Cys Ala
                                 105
Leu Ser Arg Lys Ile Gly Arg Thr
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<212> PRT
<213> HOMO SAPIEN
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Pro Gly Val Ser Glu Thr Ala Pro Ala Ser Arg Arg Gly Glu Leu Ala
Val Cys Asp Ala Val Ser Gly Trp Val Thr Asp Arg Arg Thr Ala Val
Asp Leu Arg Gly Arg Glu Val Glu Val Leu Gly Glu Val Pro Ala Ala
Gly Gly Ser Pro Leu Arg Gln Tyr Phe Phe Glu Thr Arg Cys Lys Ala
Asp Asn Ala Glu Glu Gly Gly Pro Gly Ala Gly Gly Gly Cys Arg
Gly Val Asp Arg Arg His Trp Val Ser Glu Cys Lys Ala Lys Gln Ser
                85
                                     90
Tyr Val Arg Ala Leu Thr Ala Asp Ala Gln Gly Arg Val Gly Trp Arg
            100
                                105
Trp Ile Arg Ile Asp Thr Ala Cys Val Cys Thr Leu Leu Ser Arg Thr
        115
                             120
Gly Arg Ala
    130
<210> 13
<211> 113
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<213> HOMO SAPIEN
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Pro Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys
                                     10
Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys
Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly Pro
Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val Leu Ala
                         55
Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys Val
                    70
Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly Arg Lys
                                     90
Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys Lys Cys
                                 105
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<212> PRT

<213> HOMO SAPIEN

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<210> 14
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   <212> PRT
   <213> HOMO SAPIEN
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   Pro Ala Leu Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys
                                       10
   Cys Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys
   Trp Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala
                                40
   Cys Pro Tyr Leu Trp Ser Ser Asp Thr Gln His Ser Arg Val Leu Ser
                           55
   Leu Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val
                       70
   Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Lys Thr
                  85
                                       90
   Pro Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys
               100
                                   105
   Ser
(Q
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   <210> 15
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   <213> HOMO SAPIEN
  <400> 15
   Pro Ala Leu Asp Thr Asn Tyr Cys Phe Arg Asn Leu Glu Glu Asn Cys
   Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys
                                   25
   Trp Val His Glu Pro Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro
                               40
   Cys Pro Tyr Leu Arg Ser Ala Asp Thr Thr His Ser Thr Val Leu Gly
                           55
                                                60
   Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val
   Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr
                                        90
   Pro Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys Lys Cys
                                   105
   Ser
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   Pro Met Trp Pro Leu Trp Leu Cys Trp Ala Leu Trp Val Leu Pro Leu
   Ala Gly Pro Gly Ala Ala Leu Thr Glu Glu Gln Leu Leu Ala Ser Leu
                                   25
   Leu Arg Gln Leu Gln Leu Ser Glu Val Pro Val Leu Asp Arg Ala Asp
                               40
   Met Glu Lys Leu Val Ile Pro Ala His Val Arg Ala Gln Tyr Val Val
                           55
   Leu Leu Arg Arg Asp Gly Asp Arg Ser Arg Gly Lys Arg Phe Ser Gln
                                           75
   Ser Phe Arg Glu Val Ala Gly Arg Phe Leu Ala Ser Glu Ala Ser Thr
                   85
                                       90
   His Leu Leu Val Phe Gly Met Glu Gln Arg Leu Pro Pro Asn Ser Glu
               100
                                   105
   Leu Val Gln Ala Val Leu Arg Leu Phe Gln Glu Pro Val Pro Gln Gly
                               120
   Ala Leu His Arg His Gly Arg Leu Ser Pro Ala Ala Pro Lys Ala Arg
                           135
                                               140
   Val Thr Val Glu Trp Leu Val Arg Asp Asp Gly Ser Asn Arg Thr Ser
                      150
                                          155
   Leu Ile Asp Ser Arg Leu Val Ser Val His Glu Ser Gly Trp Lys Ala
                   165
                                       170
   Phe Asp Val Thr Glu Ala Val Asn Phe Trp Gln Gln Leu Ser Arg Pro
                                   185
   Pro Glu Pro Leu Leu Val Gln Val Ser Val Gln Arg Glu His Leu Gly
           195
                               200
                                                   205
   Pro Leu Ala Ser Gly Ala His Lys Leu Val Arg Phe Ala Ser Gln Gly
                           215
                                               220
  Ala Pro Ala Gly Leu Gly Glu Pro Gln Leu Glu Leu His Thr Leu Asp
                       230
                                           235
   Leu Arg Asp Tyr Gly Ala Gln Gly Asp Cys Asp Pro Glu Ala Pro Met
                                       250
   Thr Glu Gly Thr Arg Cys Cys Arg Gln Glu Met Tyr Ile Asp Leu Gln
               260
                                   265
Gly Met Lys Trp Ala Lys Asn Trp Val Leu Glu Pro Pro Gly Phe Leu
                               280
  Ala Tyr Glu Cys Val Gly Thr Cys Gln Gln Pro Pro Glu Ala Leu Ala
                           295
                                               300
   Phe Asn Trp Pro Phe Leu Gly Pro Arg Gln Cys Ile Ala Ser Glu Thr
                       310
                                           315
   Ala Ser Leu Pro Met Ile Val Ser Ile Lys Glu Gly Gly Arg Thr Arg
                   325
                                       330
   Pro Gln Val Val Ser Leu Pro Asn Met Arg Val Gln Lys Cys Ser Cys
               340
                                   345
   Ala Ser Asp Gly Ala Leu Val Pro Arg Arg Leu Gln His Arg Pro Trp
                               360
   Cys Ile His
       370
   <210> 17
   <211> 198
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<212> PRT <213> HOMO SAPIEN

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Pro Met Gln Arg Trp Lys Ala Ala Leu Ala Ser Val Leu Cys Ser
   Ser Val Leu Ser Ile Trp Met Cys Arg Glu Gly Leu Leu Ser His
   Arg Leu Gly Pro Ala Leu Val Pro Leu His Arg Leu Pro Arg Thr Leu
                               40
   Asp Ala Arg Ile Ala Arg Leu Ala Gln Tyr Arg Ala Leu Leu Gln Gly
   Ala Pro Asp Ala Met Glu Leu Arg Glu Leu Thr Pro Trp Ala Gly Arg
                       70
   Pro Pro Gly Pro Arg Arg Ala Gly Pro Arg Arg Arg Ala Arg
                                       90
   Ala Arg Leu Gly Ala Arg Pro Cys Gly Leu Arg Glu Leu Glu Val Arg
                                  105
   Val Ser Glu Leu Gly Leu Gly Tyr Ala Ser Asp Glu Thr Val Leu Phe
                               120
   Arg Tyr Cys Ala Gly Ala Cys Glu Ala Ala Ala Arg Val Tyr Asp Leu
                           135
   Gly Leu Arg Arg Leu Arg Gln Arg Arg Leu Arg Arg Glu Arg Val
                      150
                                          155
   Arg Ala Gln Pro Cys Cys Arg Pro Thr Ala Tyr Glu Asp Glu Val Ser
                  165
                                      170
Phe Leu Asp Ala His Ser Arg Tyr His Thr Val His Glu Leu Ser Ala
              180
                                  185
  Arg Glu Cys Ala Cys Val
          195
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   <213> HOMO SAPIEN
  <400> 18
Pro Met Val Leu His Leu Leu Leu Phe Leu Leu Leu Thr Pro Gln Gly
                                      10
  Gly His Ser Cys Gln Gly Leu Glu Leu Ala Arg Glu Leu Val Leu Ala
                                   25
Ë Lys Val Arg Ala Leu Phe Leu Asp Ala Leu Gly Pro Pro Ala Val Thr
   Arg Glu Gly Gly Asp Pro Gly Val Arg Arg Leu Pro Arg Arg His Ala
                           55
                                              60
   Leu Gly Gly Phe Thr His Arg Gly Ser Glu Pro Glu Glu Glu Glu Asp
                      70
                                          75
   Val Ser Gln Ala Ile Leu Phe Pro Ala Thr Asp Ala Ser Cys Glu Asp
                                       90
   Lys Ser Ala Ala Arg Gly Leu Ala Gln Glu Ala Glu Glu Gly Leu Phe
                                   105
   Arg Tyr Met Phe Arg Pro Ser Gln His Thr Arg Ser Arg Gln Val Thr
                               120
   Ser Ala Gln Leu Trp Phe His Thr Gly Leu Asp Arg Gln Gly Thr Ala
                           135
   Ala Ser Asn Ser Ser Glu Pro Leu Leu Gly Leu Leu Ala Leu Ser Pro
                       150
                                          155
   Gly Gly Pro Val Ala Val Pro Met Ser Leu Gly His Ala Pro Pro His
                                      170
   Trp Ala Val Leu His Leu Ala Thr Ser Ala Leu Ser Leu Leu Thr His
```

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180
                                   185
   Pro Val Leu Val Leu Leu Arg Cys Pro Leu Cys Thr Cys Ser Ala
                               200
   Arg Pro Glu Ala Thr Pro Phe Leu Val Ala His Thr Arg Thr Arg Pro
                          215
                                               220
   Pro Ser Gly Glu Arg Ala Arg Arg Ser Thr Pro Leu Met Ser Trp
                      230
                                          235
   Pro Trp Ser Pro Ser Ala Leu Arg Leu Leu Gln Arg Pro Pro Glu Glu
                   245
                                       250
   Pro Ala Ala His Ala Asn Cys His Arg Val Ala Leu Asn Ile Ser Phe
              260
                                  265
   Gln Glu Leu Gly Trp Glu Arg Trp Ile Val Tyr Pro Pro Ser Phe Ile
                               280
   Phe His Tyr Cys His Gly Gly Cys Gly Leu His Ile Pro Pro Asn Leu
                           295
                                               300
   Ser Leu Pro Val Pro Gly Ala Pro Pro Thr Pro Ala Gln Pro Tyr Ser
                       310
                                           315
   Leu Leu Pro Gly Ala Gln Pro Cys Cys Ala Ala Leu Pro Gly Thr Met
                   325
                                       330
   Arg Pro Leu His Val Arg Thr Thr Ser Asp Gly Gly Tyr Ser Phe Lys
                                   345
   Tyr Glu Thr Val Pro Asn Leu Leu Thr Gln His Cys Ala Cys Ile
                               360
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                                       10
  Ile Ile Val Arg Ser Ser Pro Thr Pro Gly Ser Glu Gly His Ser Ala
              20
                                   25
   Ala Pro Asp Cys Pro Ser Cys Ala Leu Ala Ala Leu Pro Lys Asp Val
                               40
   Pro Asn Ser Gln Pro Glu Met Val Glu Ala Val Lys Lys His Ile Leu
                           55
   Asn Met Leu His Leu Lys Lys Arg Pro Asp Val Thr Gln Pro Val Pro
                       70
                                           75
   Lys Ala Ala Leu Leu Asn Ala Ile Arg Lys Leu His Val Gly Lys Val
                                       90
   Gly Glu Asn Gly Tyr Val Glu Ile Glu Asp Asp Ile Gly Arg Arg Ala
               100
                                   105
   Glu Met Asn Glu Leu Met Glu Gln Thr Ser Glu Ile Ile Thr Phe Ala
                               120
   Glu Ser Gly Thr Ala Arg Lys Thr Leu His Phe Glu Ile Ser Lys Glu
                           135
                                               140
   Gly Ser Asp Leu Ser Val Val Glu Arg Ala Glu Val Trp Leu Phe Leu
                      150
                                          155
   Lys Val Pro Lys Ala Asn Arg Thr Arg Thr Lys Val Thr Ile Arg Leu
                   165
                                       170
   Phe Gln Gln Gln Lys His Pro Gln Gly Ser Leu Asp Thr Gly Glu Glu
                                  185
   Ala Glu Glu Val Gly Leu Lys Gly Glu Arg Ser Glu Leu Leu Ser
                               200
           195
                                                   205
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Glu Lys Val Val Asp Ala Arq Lys Ser Thr Trp His Val Phe Pro Val
                           215
                                               220
   Ser Ser Ser Ile Gln Arg Leu Leu Asp Gln Gly Lys Ser Ser Leu Asp
                       230
                                           235
   Val Arg Ile Ala Cys Glu Gln Cys Gln Glu Ser Gly Ala Ser Leu Val
                                       250
   Leu Leu Gly Lys Lys Lys Lys Glu Glu Glu Gly Glu Gly Lys Lys
                                   265
   Lys Gly Gly Glu Gly Gly Ala Gly Ala Asp Glu Glu Lys Glu Gln
                               280
                                                   285
   Ser His Arg Pro Phe Leu Met Leu Gln Ala Arg Gln Ser Glu Asp His
                           295
                                               300
   Pro His Arg Arg Arg Arg Gly Leu Glu Cys Asp Gly Lys Val Asn
                       310
                                           315
   Ile Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp
                                       330
   Asn Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu
               340
                                   345
   Gly Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser
                               360
   Phe His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro
                           375
                                               380
   Phe Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met
                       390
                                           395
   Ser Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile
ťû
                  405
                                      410
   Gln Asn Met Ile Val Glu Glu Cys Gly Cys Ser
Ш
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  <210> 20
   <211> 408
   <212> PRT
   <213> HOMO SAPIEN
NJ
  <400> 20
   Pro Met Asp Gly Leu Pro Gly Arg Ala Leu Gly Ala Ala Cys Leu Leu
Leu Leu Ala Ala Gly Trp Leu Gly Pro Glu Ala Trp Gly Ser Pro Thr
               20
                                   25
   Pro Pro Pro Thr Pro Ala Ala Pro Pro Pro Pro Pro Pro Pro Gly Ser
                               40
   Pro Gly Gly Ser Gln Asp Thr Cys Thr Ser Cys Gly Gly Phe Arg Arg
                           55
   Pro Glu Glu Leu Gly Arg Val Asp Gly Asp Phe Leu Glu Ala Val Lys
   Arg His Ile Leu Ser Arg Leu Gln Met Arg Gly Arg Pro Asn Ile Thr
                                       90
   His Ala Val Pro Lys Ala Ala Met Val Thr Ala Leu Arg Lys Leu His
                                   105
   Ala Gly Lys Val Arg Glu Asp Gly Arg Val Glu Ile Pro His Leu Asp
           115
                               120
                                                   125
   Gly His Ala Ser Pro Gly Ala Asp Gly Gln Glu Arg Val Ser Glu Ile
                           135
                                               140
   Ile Ser Phe Ala Glu Thr Asp Gly Leu Ala Ser Ser Arg Val Arg Leu
                       150
                                           155
   Tyr Phe Phe Ile Ser Asn Glu Gly Asn Gln Asn Leu Phe Val Val Gln
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Ala Ser Leu Trp Leu Tyr Leu Lys Leu Pro Tyr Val Leu Glu Lys
                                   185
   Gly Ser Arg Arg Lys Val Arg Val Lys Val Tyr Phe Gln Glu Gln Gly
                               200
   His Gly Asp Arg Trp Asn Met Val Glu Lys Arg Val Asp Leu Lys Arg
                           215
   Ser Gly Trp His Thr Phe Pro Leu Thr Glu Ala Ile Gln Ala Leu Phe
                       230
                                           235
   Glu Arg Gly Glu Arg Arg Leu Asn Leu Asp Val Gln Cys Asp Ser Cys
                                       250
   Gln Glu Leu Ala Val Val Pro Val Phe Val Asp Pro Gly Glu Glu Ser
               260
                                   265
   His Arg Pro Phe Val Val Val Gln Ala Arg Leu Gly Asp Ser Arg His
                               280
   Arg Ile Arg Lys Arg Gly Leu Glu Cys Asp Gly Arg Thr Asn Leu Cys
                           295
                                               300
   Cys Arg Gln Gln Phe Phe Ile Asp Phe Arg Leu Ile Gly Trp Asn Asp
                       310
                                           315
   Trp Ile Ile Ala Pro Thr Gly Tyr Tyr Gly Asn Tyr Cys Glu Gly Ser
                   325
                                       330
   Cys Pro Ala Tyr Leu Ala Gly Val Pro Gly Ser Ala Ser Ser Phe His
               340
                                   345
   Thr Ala Val Val Asn Gln Tyr Arg Met Arg Gly Leu Asn Pro Gly Thr
                               360
   Val Asn Ser Cys Cys Ile Pro Thr Lys Leu Ser Thr Met Ser Met Leu
                           375
                                               380
   Tyr Phe Asp Asp Glu Tyr Asn Ile Val Lys Arg Asp Val Pro Asn Met
                       390
                                          395
   Ile Val Glu Glu Cys Gly Cys Ala
ţġ
                   405
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   <213> HOMO SAPIEN
  <400> 21
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   Ile Ile Val Arg Ser Ser Pro Thr Pro Gly Ser Glu Gly His Ser Ala
               20
                                   2.5
   Ala Pro Asp Cys Pro Ser Cys Ala Leu Ala Ala Leu Pro Lys Asp Val
   Pro Asn Ser Gln Pro Glu Met Val Glu Ala Val Lys Lys His Ile Leu
   Asn Met Leu His Leu Lys Lys Arg Pro Asp Val Thr Gln Pro Val Pro
   Lys Ala Ala Leu Leu Asn Ala Ile Arg Lys Leu His Val Gly Lys Val
                                       90
   Gly Glu Asn Gly Tyr Val Glu Ile Glu Asp Asp Ile Gly Arg Arg Ala
                                   105
   Glu Met Asn Glu Leu Met Glu Gln Thr Ser Glu Ile Ile Thr Phe Ala
                               120
   Glu Ser Gly Thr Ala Arg Lys Thr Leu His Phe Glu Ile Ser Lys Glu
                           135
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Gly Ser Asp Leu Ser Val Val Glu Arg Ala Glu Val Trp Leu Phe Leu
                       150
   Lys Val Pro Lys Ala Asn Arg Thr Arg Thr Lys Val Thr Ile Arg Leu
                                       170
   Phe Gln Gln Gln Lys His Pro Gln Gly Ser Leu Asp Thr Gly Glu Glu
                                   185
   Ala Glu Glu Val Gly Leu Lys Gly Glu Arg Ser Glu Leu Leu Ser
                               200
   Glu Lys Val Val Asp Ala Arg Lys Ser Thr Trp His Val Phe Pro Val
                           215
                                               220
   Ser Ser Ser Ile Gln Arg Leu Leu Asp Gln Gly Lys Ser Ser Leu Asp
                       230
                                           235
   Val Arg Ile Ala Cys Glu Gln Cys Gln Glu Ser Gly Ala Ser Leu Val
                   245
                                       250
   Leu Leu Gly Lys Lys Lys Lys Glu Glu Glu Gly Glu Gly Lys Lys
                                   265
   Lys Gly Gly Glu Gly Gly Ala Gly Ala Asp Glu Glu Lys Glu Gln
                               280
   Ser His Arg Pro Phe Leu Met Leu Gln Ala Arg Gln Ser Glu Asp His
                           295
   Pro His Arg Arg Arg Arg Gly Leu Glu Cys Asp Gly Lys Val Asn
                       310
                                           315
   Ile Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp
                   325
                                       330
   Asn Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu
(O
              340
                                   345
   Gly Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser
          355
                               360
   Phe His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro
                           375
                                               380
   Phe Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met
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                                           395
   Ser Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile
   Gln Asn Met Ile Val Glu Glu Cys Gly Cys Ser
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   Pro Met Asp Gly Leu Pro Gly Arg Ala Leu Gly Ala Ala Cys Leu Leu
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   Pro Pro Pro Thr Pro Ala Ala Pro Pro Pro Pro Pro Pro Gly Ser
   Pro Gly Gly Ser Gln Asp Thr Cys Thr Ser Cys Gly Gly Phe Arg Arg
                           55
   Pro Glu Glu Leu Gly Arg Val Asp Gly Asp Phe Leu Glu Ala Val Lys
   Arg His Ile Leu Ser Arg Leu Gln Met Arg Gly Arg Pro Asn Ile Thr
                                       90
   His Ala Val Pro Lys Ala Ala Met Val Thr Ala Leu Arg Lys Leu His
```

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100
                                   105
   Ala Gly Lys Val Arg Glu Asp Gly Arg Val Glu Ile Pro His Leu Asp
                               120
                                                   125
   Gly His Ala Ser Pro Gly Ala Asp Gly Gln Glu Arg Val Ser Glu Ile
                           135
   Ile Ser Phe Ala Glu Thr Asp Gly Leu Ala Ser Ser Arg Val Arg Leu
                       150
                                           155
   Tyr Phe Phe Ile Ser Asn Glu Gly Asn Gln Asn Leu Phe Val Val Gln
                   165
                                       170
   Ala Ser Leu Trp Leu Tyr Leu Lys Leu Pro Tyr Val Leu Glu Lys
               180
                                   185
   Gly Ser Arg Arg Lys Val Arg Val Lys Val Tyr Phe Gln Glu Gln Gly
                               200
                                                   205
   His Gly Asp Arg Trp Asn Met Val Glu Lys Arg Val Asp Leu Lys Arg
                           215
                                               220
   Ser Gly Trp His Thr Phe Pro Leu Thr Glu Ala Ile Gln Ala Leu Phe
                       230
   Glu Arg Gly Glu Arg Arg Leu Asn Leu Asp Val Gln Cys Asp Ser Cys
                   245
                                       250
   Gln Glu Leu Ala Val Val Pro Val Phe Val Asp Pro Gly Glu Glu Ser
                                   265
   His Arg Pro Phe Val Val Val Gln Ala Arg Leu Gly Asp Ser Arg His
                               280
   Arg Ile Arg Lys Arg Gly Leu Glu Cys Asp Gly Arg Thr Asn Leu Cys
                           295
                                               300
   Cys Arg Gln Gln Phe Phe Ile Asp Phe Arg Leu Ile Gly Trp Asn Asp
                       310
                                           315
   Trp Ile Ile Ala Pro Thr Gly Tyr Tyr Gly Asn Tyr Cys Glu Gly Ser
                                       330
   Cys Pro Ala Tyr Leu Ala Gly Val Pro Gly Ser Ala Ser Ser Phe His
ſÛ
               340
                                   345
   Thr Ala Val Val Asn Gln Tyr Arg Met Arg Gly Leu Asn Pro Gly Thr
                               360
   Val Asn Ser Cys Cys Ile Pro Thr Lys Leu Ser Thr Met Ser Met Leu
                           375
                                               380
   Tyr Phe Asp Asp Glu Tyr Asn Ile Val Lys Arg Asp Val Pro Asn Met
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🗓 Ile Val Glu Glu Cys Gly Cys Ala
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   Asp Leu Ala Thr Phe Gly Val Cys Asn Thr Gly Asp Arg Gln Ala Ala
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   Leu Pro Ser Leu Arg Arg Leu Gly Ala Trp Leu Arg Asp Pro Gly Gly
                               120
   Gln Arg Leu Val Val Leu His Leu Glu Glu Val Thr Trp Glu Pro Thr
                          135
                                               140
   Pro Ser Leu Arg Phe Gln Glu Pro Pro Pro Gly Gly Ala Gly Pro Pro
                       150
                                          155
   Glu Leu Ala Leu Leu Val Leu Tyr Pro Gly Pro Gly Pro Glu Val Thr
                  165
                                       170
   Val Thr Arg Ala Gly Leu Pro Gly Ala Gln Ser Leu Cys Pro Ser Arg
               180
                                   185
   Asp Thr Arg Tyr Leu Val Leu Ala Val Asp Arg Pro Ala Gly Ala Trp
                               200
   Arg Gly Ser Gly Leu Ala Leu Thr Leu Gln Pro Arg Gly Glu Asp Ser
                           215
   Arg Leu Ser Thr Ala Arg Leu Gln Ala Leu Leu Phe Gly Asp Asp His
                       230
                                          235
   Arg Cys Phe Thr Arg Met Thr Pro Ala Leu Leu Leu Pro Arg Ser
                   245
                                      250
   Glu Pro Ala Pro Leu Pro Ala His Gly Gln Leu Asp Thr Val Pro Phe
              260
                                   265
   Pro Pro Pro Arg Pro Ser Ala Glu Leu Glu Glu Ser Pro Pro Ser Ala
ſŮ
           275
                               280
   Asp Pro Phe Leu Glu Thr Leu Thr Arg Leu Val Arg Ala Leu Arg Val
                          295
                                               300
   Pro Pro Ala Arg Ala Ser Ala Pro Arg Leu Ala Leu Asp Pro Asp Ala
                       310
                                           315
Leu Ala Gly Phe Pro Gln Gly Leu Val Asn Leu Ser Asp Pro Ala Ala
                                       330
   Leu Glu Arg Leu Leu Asp Gly Glu Pro Leu Leu Leu Leu Arg
               340
                                   345
   Pro Thr Ala Ala Thr Thr Gly Asp Pro Ala Pro Leu His Asp Pro Thr
TU
                               360
   Ser Ala Pro Trp Ala Thr Ala Leu Ala Arg Arg Val Ala Ala Glu Leu
                           375
                                               380
🖆 Gln Ala Ala Ala Ala Glu Leu Arg Ser Leu Pro Gly Leu Pro Pro Ala
                       390
                                           395
   Thr Ala Pro Leu Leu Ala Arg Leu Leu Ala Leu Cys Pro Gly Gly Pro
                   405
                                       410
   Gly Gly Leu Gly Asp Pro Leu Arg Ala Leu Leu Leu Lys Ala Leu
               420
                                   425
   Gln Gly Leu Arg Val Glu Trp Arg Gly Arg Asp Pro Arg Gly Pro Gly
                               440
   Arg Ala Gln Arg Ser Ala Gly Ala Thr Ala Ala Asp Gly Pro Cys Ala
                           455
   Leu Arg Glu Leu Ser Val Asp Leu Arg Ala Glu Arg Ser Val Leu Ile
                       470
                                           475
   Pro Glu Thr Tyr Gln Ala Asn Asn Cys Gln Gly Val Cys Gly Trp Pro
                                       490
   Gln Ser Asp Arg Asn Pro Arg Tyr Gly Asn His Val Val Leu Leu Leu
                                   505
   Lys Met Gln Ala Arg Gly Ala Ala Leu Ala Arg Pro Pro Cys Cys Val
                           520
   Pro Thr Ala Tyr Ala Gly Lys Leu Leu Ile Ser Leu Ser Glu Glu Arg
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530
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Ile Ser Ala His His Val Pro Asn Met Val Ala Thr Glu Cys Gly Cys
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                    550
                                        555
Arg
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Val Leu Leu Gly Gly Ala Ala Gly Leu Val Pro Glu Leu Gly Arg Arg
            20
Lys Phe Ala Ala Ser Ser Gly Arg Pro Ser Ser Gln Pro Ser Asp
                            40
Glu Val Leu Ser Glu Phe Glu Leu Arg Leu Leu Ser Met Phe Gly Leu
                        55
Lys Gln Arg Pro Thr Pro Ser Arg Asp Ala Val Val Pro Pro Tyr Met
Leu Asp Leu Tyr Arg Arg His Ser Gly Gln Pro Gly Ser Pro Ala Pro
                                    90
Asp His Arg Leu Glu Arg Ala Ala Ser Arg Ala Asn Thr Val Arg Ser
            100
                                105
Phe His His Glu Glu Ser Leu Glu Glu Leu Pro Glu Thr Ser Gly Lys
        115
                            120
Thr Thr Arg Arg Phe Phe Phe Asn Leu Ser Ser Ile Pro Thr Glu Glu
                        135
                                            140
Phe Ile Thr Ser Ala Glu Leu Gln Val Phe Arg Glu Gln Met Gln Asp
                    150
                                        155
Ala Leu Gly Asn Asn Ser Ser Phe His His Arg Ile Asn Ile Tyr Glu
                165
                                    170
Ile Ile Lys Pro Ala Thr Ala Asn Ser Lys Phe Pro Val Thr Arg Leu
                                185
Leu Asp Thr Arg Leu Val Asn Gln Asn Ala Ser Arg Trp Glu Ser Phe
                            200
                                                205
Asp Val Thr Pro Ala Val Met Arg Trp Thr Ala Gln Gly His Ala Asn
                        215
                                            220
His Gly Phe Val Val Glu Val Ala His Leu Glu Glu Lys Gln Gly Val
                    230
                                        235
Ser Lys Arg His Val Arg Ile Ser Arg Ser Leu His Gln Asp Glu His
                                    250
Ser Trp Ser Gln Ile Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly
            260
                                265
Lys Gly His Pro Leu His Lys Arg Glu Lys Arg Gln Ala Lys His Lys
                            280
Gln Arg Lys Arg Leu Lys Ser Ser Cys Lys Arg His Pro Leu Tyr Val
                        295
                                            300
Asp Phe Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly
                    310
                                        315
Tyr His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp
                325
                                    330
His Leu Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser
```

350

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Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser
                               360
   Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys
   Asn Tyr Gln Asp Met Val Val Glu Gly Cys Gly Cys Arg
                       390
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   Cys Val Ser Leu Ala Gln Gly Glu Arg Pro Lys Pro Pro Phe Pro Glu
   Leu Arg Lys Ala Val Pro Gly Asp Arg Thr Ala Gly Gly Gly Pro Asp
                               40
   Ser Glu Leu Gln Pro Gln Asp Lys Val Ser Glu His Met Leu Arg Leu
                           55
  Tyr Asp Arg Tyr Ser Thr Val Gln Ala Ala Arg Thr Pro Gly Ser Leu
                       70
                                           75
   Glu Gly Gly Ser Gln Pro Trp Arg Pro Arg Leu Leu Arg Glu Gly Asn
                   85
                                       90
   Thr Val Arg Ser Phe Arg Ala Ala Ala Glu Thr Leu Glu Arg Lys
              100
                                   105
   Gly Leu Tyr Ile Phe Asn Leu Thr Ser Leu Thr Lys Ser Glu-Asn Ile
          115
                               120
  Leu Ser Ala Thr Leu Tyr Phe Cys Ile Gly Glu Leu Gly Asn Ile Ser
                           135
  Leu Ser Cys Pro Val Ser Gly Gly Cys Ser His His Ala Gln Arg Lys
                       150
                                           155
  His Ile Gln Ile Asp Leu Ser Ala Trp Thr Leu Lys Phe Ser Arg Asn
                                       170
Gln Ser Gln Leu Leu Gly His Leu Ser Val Asp Met Ala Lys Ser His
               180
                                   185
🏥 Arg Asp Ile Met Ser Trp Leu Ser Lys Asp Ile Thr Gln Phe Leu Arg
                               200
   Lys Ala Lys Glu Asn Glu Glu Phe Leu Ile Gly Phe Asn Ile Thr Ser
                           215
                                               220
   Lys Gly Arg Gln Leu Pro Lys Arg Arg Leu Pro Phe Pro Glu Pro Tyr
                       230
                                           235
   Ile Leu Val Tyr Ala Asn Asp Ala Ala Ile Ser Glu Pro Glu Ser Val
                   245
                                       250
   Val Ser Ser Leu Gln Gly His Arg Asn Phe Pro Thr Gly Thr Val Pro
                                   265
   Lys Trp Asp Ser His Ile Arg Ala Ala Leu Ser Ile Glu Arg Arg Lys
           275
                               280
   Lys Arg Ser Thr Gly Val Leu Leu Pro Leu Gln Asn Asn Glu Leu Pro
                           295
   Gly Ala Glu Tyr Gln Tyr Lys Lys Asp Glu Val Trp Glu Glu Arg Lys
                       310
                                           315
   Pro Tyr Lys Thr Leu Gln Ala Gln Ala Pro Glu Lys Ser Lys Asn Lys
                                       330
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Lys Lys Gln Arg Lys Gly Pro His Arg Lys Ser Gln Thr Leu Gln Phe

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345
Asp Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Glu Pro
                             360
Arg Asn Cys Ala Arg Arg Tyr Leu Lys Val Asp Phe Ala Asp Ile Gly
                         375
                                             380
Trp Ser Glu Trp Ile Ile Ser Pro Lys Ser Phe Asp Ala Tyr Tyr Cys
                    390
                                        395
Ser Gly Ala Cys Gln Phe Pro Met Pro Lys Ser Leu Lys Pro Ser Asn
                405
                                    410
His Ala Thr Ile Gln Ser Ile Val Arg Ala Val Gly Val Val Pro Gly
                                 425
Ile Pro Glu Pro Cys Cys Val Pro Glu Lys Met Ser Ser Leu Ser Ile
                            440
Leu Phe Phe Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn
                         455
Met Thr Val Glu Ser Cys Ala Cys Arg
                     470
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<211> 479
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Pro Met Ala His Val Pro Ala Arg Thr Ser Pro Gly Pro Gly Pro Gln
                                     10
Leu Leu Leu Leu Leu Pro Leu Phe Leu Leu Leu Arg Asp Val
            20
Ala Gly Ser His Arg Ala Pro Ala Trp Ser Ala Leu Pro Ala Ala Ala
Asp Gly Leu Gln Gly Asp Arg Asp Leu Gln Arg His Pro Gly Asp Ala
Ala Ala Thr Leu Gly Pro Ser Ala Gln Asp Met Val Ala Val His Met
                    70
                                        75
His Arg Leu Tyr Glu Lys Tyr Ser Arg Gln Gly Ala Arg Pro Gly Gly
Gly Asn Thr Val Arg Ser Phe Arg Ala Arg Leu Glu Val Val Asp Gln
            100
                                105
Lys Ala Val Tyr Phe Phe Asn Leu Thr Ser Met Gln Asp Ser Glu Met
                            120
Ile Leu Thr Ala Thr Phe His Phe Tyr Ser Glu Pro Pro Arg Trp Pro
                        135
Arg Ala Leu Glu Val Leu Cys Lys Pro Arg Ala Lys Asn Ala Ser Gly
                    150
                                        155
Arg Pro Leu Pro Leu Gly Pro Pro Thr Arg Gln His Leu Leu Phe Arg
                                     170
Ser Leu Ser Gln Asn Thr Ala Thr Gln Gly Leu Leu Arg Gly Ala Met
            180
                                 185
Ala Leu Ala Pro Pro Pro Arg Gly Leu Trp Gln Ala Lys Asp Ile Ser
                            200
Pro Ile Val Lys Ala Ala Arg Arg Asp Gly Glu Leu Leu Ser Ala
                        215
                                            220
Gln Leu Asp Ser Glu Glu Arg Asp Pro Gly Val Pro Arg Pro Ser Pro
                    230
                                        235
Tyr Ala Pro Tyr Ile Leu Val Tyr Ala Asn Asp Leu Ala Ile Ser Glu
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245

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Pro Asn Ser Val Ala Val Thr Leu Gln Arg Tyr Asp Pro Phe Pro Ala
                                   265
   Gly Asp Pro Glu Pro Arg Ala Ala Pro Asn Asn Ser Ala Asp Pro Arg
                               280
   Val Arg Arg Ala Ala Gln Ala Thr Gly Pro Leu Gln Asp Asn Glu Leu
                          295
                                               300
   Pro Gly Leu Asp Glu Arg Pro Pro Arg Ala His Ala Gln His Phe His
                       310
                                           315
   Lys His Gln Leu Trp Pro Ser Pro Phe Arg Ala Leu Lys Pro Arg Pro
                                       330
   Gly Arg Lys Asp Arg Lys Lys Gly Gln Glu Val Phe Met Ala Ala
               340
                                   345
   Ser Gln Val Leu Asp Phe Asp Glu Lys Thr Met Gln Lys Ala Arg Arg
                               360
   Lys Gln Trp Asp Glu Pro Arg Val Cys Ser Arg Arg Tyr Leu Lys Val
                           375
                                               380
   Asp Phe Ala Asp Ile Gly Trp Asn Glu Trp Ile Ile Ser Pro Lys Ser
                       390
                                           395
   Phe Asp Ala Tyr Tyr Cys Ala Gly Ala Cys Glu Phe Pro Met Pro Lys
                   405
                                       410
   Ile Val Arg Pro Ser Asn His Ala Thr Ile Gln Ser Ile Val Arg Ala
               420
                                   425
  Val Gly Ile Ile Pro Gly Ile Pro Glu Pro Cys Cys Val Pro Asp Lys
                               440
                                                  445
  Met Asn Ser Leu Gly Val Leu Phe Leu Asp Glu Asn Arg Asn Val Val
                          455
                                              460
   Leu Lys Val Tyr Pro Asn Met Ser Val Asp Thr Cys Ala Cys Arg
                       470
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  <213> HOMO SAPIEN
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   Pro Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu Leu Cys Gln
                                       10
   Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro Glu Thr Gly
   Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly Arg Arg Ser
                               40
                                                   45
   Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr Leu Leu Gln
   Met Phe Gly Leu Arg Arg Pro Gln Pro Ser Lys Ser Ala Val Ile
   Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly Glu Glu Glu
   Glu Glu Gln Ile His Ser Thr Gly Leu Glu Tyr Pro Glu Arg Pro Ala
                                   105
              100
   Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu Glu His Leu Glu
                               120
   Asn Ile Pro Gly Thr Ser Glu Asn Ser Ala Phe Arg Phe Leu Phe Asn
                           135
                                               140
   Leu Ser Ser Ile Pro Glu Asn Glu Ala Ile Ser Ser Ala Glu Leu Arg
                       150
                                           155
   Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp Glu Arg Gly Phe
```

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170
   His Arg Ile Asn Ile Tyr Glu Val Met Lys Pro Pro Ala Glu Val Val
                                   185
   Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg Leu Val His His
                               200
   Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro Ala Val Leu Arg
                          215
   Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala Ile Glu Val Thr
                       230
                                           235
   His Leu His Gln Thr Arg Thr His Gln Gly Gln His Val Arg Ile Ser
                   245
                                       250
  Arg Ser Leu Pro Gln Gly Ser Gly Asn Trp Ala Gln Leu Arg Pro Leu
               260
                                   265
  Leu Val Thr Phe Gly His Asp Gly Arg Gly His Ala Leu Thr Arg Arg
                               280
   Arg Arg Ala Lys Arg Ser Pro Lys His His Ser Gln Arg Ala Arg Lys
                           295
                                               300
   Lys Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp
                       310
                                           315
   Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe
                   325
                                       330
   Tyr Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser
               340
                                   345
  Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Ser
                               360
   Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met
                           375
                                               380
  Leu Tyr Leu Asp Glu Tyr Asp Lys Val Leu Lys Asn Tyr Gln Glu
                       390
                                           395
Met Val Val Glu Gly Cys Gly Cys Arg
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  <213> HOMO SAPIEN
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   Pro Met His Leu Thr Val Phe Leu Leu Lys Gly Ile Val Gly Phe Leu
   Trp Ser Cys Trp Val Leu Val Gly Tyr Ala Lys Gly Gly Leu Gly Asp
               20
                                   25
  Asn His Val His Ser Ser Phe Ile Tyr Arg Arg Leu Arg Asn His Glu
  Arg Arg Glu Ile Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu Pro His
                           55
  Arg Pro Arg Pro Phe Ser Pro Gly Lys Gln Ala Ser Ser Ala Pro Leu
   Phe Met Leu Asp Leu Tyr Asn Ala Met Thr Asn Glu Glu Asn Pro Glu
                                       90
  Glu Ser Glu Tyr Ser Val Arg Ala Ser Leu Ala Glu Glu Thr Arg Gly
                                   105
  Ala Arg Lys Gly Tyr Pro Ala Ser Pro Asn Gly Tyr Pro Arg Arg Ile
                               120
   Gln Leu Ser Arg Thr Thr Pro Leu Thr Thr Gln Ser Pro Pro Leu Ala
                           135
```

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Ser Leu His Asp Thr Asn Phe Leu Asn Asp Ala Asp Met Val Met Ser
                       150
                                           155
   Phe Val Asn Leu Val Glu Arg Asp Lys Asp Phe Ser His Gln Arg Arg
                   165
                                       170
   His Tyr Lys Glu Phe Arg Phe Asp Leu Thr Gln Ile Pro His Gly Glu
               180
                                   185
   Ala Val Thr Ala Ala Glu Phe Arg Ile Tyr Lys Asp Arg Ser Asn Asn
                               200
   Arg Phe Glu Asn Glu Thr Ile Lys Ile Ser Ile Tyr Gln Ile Ile Lys
                           215
                                               220
   Glu Tyr Thr Asn Arg Asp Ala Asp Leu Phe Leu Leu Asp Thr Arg Lys
                       230
                                           235
   Ala Gln Ala Leu Asp Val Gly Trp Leu Val Phe Asp Ile Thr Val Thr
                   245
                                       250
   Ser Asn His Trp Val Ile Asn Pro Gln Asn Asn Leu Gly Leu Gln Leu
               260
                                   265
   Cys Ala Glu Thr Gly Asp Gly Arg Ser Ile Asn Val Lys Ser Ala Gly
                               280
                                                   285
   Leu Val Gly Arg Gln Gly Pro Gln Ser Lys Gln Pro Phe Met Val Ala
                           295
                                               300
   Phe Phe Lys Ala Ser Glu Val Leu Leu Arg Ser Val Arg Ala Ala Asn
                       310
                                           315
   Lys Arg Lys Asn Gln Asn Arg Asn Lys Ser Ser Ser His Gln Asp Ser
                   325
                                       330
   Ser Arg Met Ser Ser Val Gly Asp Tyr Asn Thr Ser Glu Gln Lys Gln
ľû
               340
                                   345
   Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp
           355
                               360
                                                   365
   Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Phe Tyr Cys Asp
                           375
                                               380
   Gly Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His
                       390
                                           395
   Ala Ile Val Gln Thr Leu Val His Leu Met Phe Pro Asp His Val Pro
                   405
                                       410
   Lys Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr
               420
                                   425
   Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val
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                               440
Val Arg Ser Cys Gly Cys His
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<400> 29

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75
Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn
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Val Ile Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
                                 105
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Pro Ala Asn Val Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys
Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Trp
Ile Ile Ala Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys
Ala Phe Pro Leu Asn Ser Ala Thr Asn His Ala Ile Val Gln Thr Leu
                         55
Val His Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro
                     70
Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn
                85
                                     90
Val Ile Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            100 .
                                 105
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Pro Met Thr Ala Leu Pro Gly Pro Leu Trp Leu Leu Gly Leu Ala Leu
Cys Ala Leu Gly Gly Gly Pro Gly Leu Arg Pro Pro Pro Gly Cys
Pro Gln Arg Arg Leu Gly Ala Arg Glu Arg Arg Asp Val Gln Arg Glu
                             40
Ile Leu Ala Val Leu Gly Leu Pro Gly Arg Pro Arg Pro Arg Ala Pro
                         55
Pro Ala Ala Ser Arg Leu Pro Ala Ser Ala Pro Leu Phe Met Leu Asp
Leu Tyr His Ala Met Ala Gly Asp Asp Glu Asp Gly Ala Pro Ala
                                     90
Glu Arg Arg Leu Gly Arg Ala Asp Leu Val Met Ser Phe Val Asn Met
                                 105
Val Glu Arg Asp Arg Ala Leu Gly His Gln Glu Pro His Trp Lys Glu
        115
                             120
Phe Arg Phe Asp Leu Thr Gln Ile Pro Ala Gly Glu Ala Val Thr Ala
                         135
                                             140
Ala Glu Phe Arg Ile Tyr Lys Val Pro Ser Ile His Leu Leu Asn Arg
                                         155
                    150
Thr Leu His Val Ser Met Phe Gln Val Val Gln Glu Gln Ser Asn Arg
                 165
                                     170
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Glu Ser Asp Leu Phe Phe Leu Asp Leu Gln Thr Leu Arg Ala Gly Asp
               180
                                   185
   Glu Gly Trp Leu Val Leu Asp Val Thr Ala Ala Ser Asp Cys Trp Leu
                               200
   Leu Lys Arg His Lys Asp Leu Gly Leu Arg Leu Tyr Val Glu Thr Glu
                          215
                                               220
   Asp Gly His Ser Val Asp Pro Gly Leu Ala Gly Leu Leu Gly Gln Arg
                      230
                                          235
   Ala Pro Arg Ser Gln Gln Pro Phe Val Val Thr Phe Phe Arg Ala Ser
                   245
                                       250
   Pro Ser Pro Ile Arg Thr Pro Arg Ala Val Arg Pro Leu Arg Arg Arg
              260
                                  265
   Gln Pro Lys Lys Ser Asn Glu Leu Pro Gln Ala Asn Arg Leu Pro Gly
                              280
                                   .
   Ile Phe Asp Asp Val His Gly Ser His Gly Arg Gln Val Cys Arg Arg
                           295
   His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Leu Asp Trp Val
                       310
                                           315
   Ile Ala Pro Gln Gly Tyr Ser Ala Tyr Tyr Cys Glu Gly Glu Cys Ser
                   325
                                       330
   Phe Pro Leu Asp Ser Cys Met Asn Ala Thr Asn His Ala Ile Leu Gln
                                  345
  Ser Leu Val His Leu Met Lys Pro Asn Ala Val Pro Lys Ala Cys Cys
                               360
   Ala Pro Thr Lys Leu Ser Ala Thr Ser Val Leu Tyr Tyr Asp Ser Ser
ťÔ
                          375
                                              380
   Asn Asn Val Ile Leu Arg Lys His Arg Asn Met Val Val Lys Ala Cys
   385
                       390
                                          395
   Gly Cys His
(O
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🚰 Pro Met Gly Ser Leu Val Leu Thr Leu Cys Ala Leu Phe Cys Leu Ala
   Ala Tyr Leu Val Ser Gly Ser Pro Ile Met Asn Leu Glu Gln Ser Pro
              20
                                   25
   Leu Glu Glu Asp Met Ser Leu Phe Gly Asp Val Phe Ser Glu Gln Asp
                               40
   Gly Val Asp Phe Asn Thr Leu Leu Gln Ser Met Lys Asp Glu Phe Leu
                           55
   Lys Thr Leu Asn Leu Ser Asp Ile Pro Thr Gln Asp Ser Ala Lys Val
   Asp Pro Pro Glu Tyr Met Leu Glu Leu Tyr Asn Lys Phe Ala Thr Asp
                   85
                                       90
   Arg Thr Ser Met Pro Ser Ala Asn Ile Ile Arg Ser Phe Lys Asn Glu
                                  105
   Asp Leu Phe Ser Gln Pro Val Ser Phe Asn Gly Leu Arg Lys Tyr Pro
                               120
                                                   125
   Leu Leu Phe Asn Val Ser Ile Pro His His Glu Glu Val Ile Met Ala
                   135
   Glu Leu Arg Leu Tyr Thr Leu Val Gln Arg Asp Arg Met Ile Tyr Asp
```

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Gly Val Asp Arg Lys Ile Thr Ile Phe Glu Val Leu Glu Ser Lys Gly
                                       170
   Asp Asn Glu Gly Glu Arg Asn Met Leu Val Leu Val Ser Gly Glu Ile
               180
                                   185
   Tyr Gly Thr Asn Ser Glu Trp Glu Thr Phe Asp Val Thr Asp Ala Ile
                               200
   Arg Arg Trp Gln Lys Ser Gly Ser Ser Thr His Gln Leu Glu Val His
                           215
                                               220
   Ile Glu Ser Lys His Asp Glu Ala Glu Asp Ala Ser Ser Gly Arg Leu
                       230
                                          235
   Glu Ile Asp Thr Ser Ala Gln Asn Lys His Asn Pro Leu Leu Ile Val
                   245
                                       250
   Phe Ser Asp Asp Gln Ser Ser Asp Lys Glu Arg Lys Glu Glu Leu Asn
               260
                                   265
   Glu Met Ile Ser His Glu Gln Leu Pro Glu Leu Asp Asn Leu Gly Leu
                               280
   Asp Ser Phe Ser Ser Gly Pro Gly Glu Glu Ala Leu Leu Gln Met Arg
                           295
   Ser Asn Ile Ile Tyr Asp Ser Thr Ala Arg Ile Arg Arg Asn Ala Lys
                       310
                                           315
   Gly Asn Tyr Cys Lys Arg Thr Pro Leu Tyr Ile Asp Phe Lys Glu Ile
                   325
                                       330
  Gly Trp Asp Ser Trp Ile Ile Ala Pro Pro Gly Tyr Glu Ala Tyr Glu
                                   345
   Cys Arg Gly Val Cys Asn Tyr Pro Leu Ala Glu His Leu Thr Pro Thr
                               360
   Lys His Ala Ile Ile Gln Ala Leu Val His Leu Lys Asn Ser Gln Lys
                           375
  Ala Ser Lys Ala Cys Cys Val Pro Thr Lys Leu Glu Pro Ile Ser Ile
                       390
                                           395
   Leu Tyr Leu Asp Lys Gly Val Val Thr Tyr Lys Phe Lys Tyr Glu Gly
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  Met Ala Val Ser Glu Cys Gly Cys Arg
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   Leu Glu Leu Arg Pro Arg Gly Glu Ala Ala Glu Gly Pro Ala Ala Ala
   Ala Ala Ala Ala Ala Ala Ala Ala Ala Gly Val Gly Gly Glu Arg
                               40
   Ser Ser Arg Pro Ala Pro Ser Val Ala Pro Glu Pro Asp Gly Cys Pro
                           55
   Val Cys Val Trp Arg Gln His Ser Arg Glu Leu Arg Leu Glu Ser Ile
   Lys Ser Gln Ile Leu Ser Lys Leu Arg Leu Lys Glu Ala Pro Asn Ile
                                       90
   Ser Arg Glu Val Val Lys Gln Leu Leu Pro Lys Ala Pro Pro Leu Gln
                                   105
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Gln Ile Leu Asp Leu His Asp Phe Gln Gly Asp Ala Leu Gln Pro Glu
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   Asp Phe Leu Glu Glu Asp Glu Tyr His Ala Thr Thr Glu Thr Val Ile
                           135
                                               140
   Ser Met Ala Gln Glu Thr Asp Pro Ala Val Gln Thr Asp Gly Ser Pro
                       150
                                           155
   Leu Cys Cys His Phe His Phe Ser Pro Lys Val Met Phe Thr Lys Val
                   165
                                      170
   Leu Lys Ala Gln Leu Trp Val Tyr Leu Arg Pro Val Pro Arg Pro Ala
              180
                                   185
   Thr Val Tyr Leu Gln Ile Leu Arg Leu Lys Pro Leu Thr Gly Glu Gly
                               200
          195
                                                   205
   Thr Ala Gly Gly Gly Gly Gly Arg Arg His Ile Arg Ile Arg Ser
                          215
   Leu Lys Ile Glu Leu His Ser Arg Ser Gly His Trp Gln Ser Ile Asp
                       230
                                           235
   Phe Lys Gln Val Leu His Ser Trp Phe Arg Gln Pro Gln Ser Asn Trp
                                       250
   Gly Ile Glu Ile Asn Ala Phe Asp Pro Ser Gly Thr Asp Leu Ala Val
              260
                                   265
   Thr Ser Leu Gly Pro Gly Ala Glu Gly Leu His Pro Phe Met Glu Leu
                               280
  Arg Val Leu Glu Asn Thr Lys Arg Ser Arg Arg Asn Leu Gly Leu Asp
                          295
                                               300
  Cys Asp Glu His Ser Ser Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr
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                                          315
   Val Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg
                  325
                                      330
🖳 Tyr Lys Ala Asn Tyr Cys Ser Gly Gln Cys Glu Tyr Met Phe Met Gln
                                   345
  Lys Tyr Pro His Thr His Leu Val Gln Gln Ala Asn Pro Arg Gly Ser
                               360
  Ala Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu
                           375
  Tyr Phe Asn Asp Lys Gln Gln Ile Ile Tyr Gly Lys Ile Pro Gly Met
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                                          395
🗖 Val Val Asp Arg Cys Gly Cys Ser
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   Val Leu Phe Met Glu His Arg Ala Gln Met Ala Glu Gly Gly Gln Ser
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   Phe Ile Ala Leu Leu Ala Glu Ala Pro Thr Leu Pro Leu Ile Glu Glu
                              40
   Met Leu Glu Glu Ser Pro Gly Glu Gln Pro Arg Lys Pro Arg Leu Leu
                          55
   Gly His Ser Leu Arg Tyr Met Leu Glu Leu Tyr Arg Arg Ser Ala Asp
                       70
                                        75
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Ser His Gly His Pro Arg Glu Asn Arg Thr Ile Gly Ala Thr Met Val

```
Arg Leu Val Lys Pro Leu Thr Ser Val Ala Arg Pro His Arg Gly Thr
                                   105
   Trp His Ile Gln Ile Leu Gly Phe Pro Leu Arg Pro Asn Arg Gly Leu
                               120
   Tyr Gln Leu Val Arg Ala Thr Val Val Tyr Arg His His Leu Gln Leu
                          135
   Thr Arg Phe Asn Leu Ser Cys His Val Glu Pro Trp Val Gln Lys Asn
                      150
                                          155
   Pro Thr Asn His Phe Pro Ser Ser Glu Gly Asp Ser Ser Lys Pro Ser
                  165
                                       170
   Leu Met Ser Asn Ala Trp Lys Glu Met Asp Ile Thr Gln Leu Val Gln
              180
                                  185
   Gln Arg Phe Trp Asn Asn Lys Gly His Arg Ile Leu Arg Leu Arg Phe
                               200
   Met Cys Gln Gln Gln Lys Asp Ser Gly Gly Leu Glu Leu Trp His Gly
                           215
   Thr Ser Ser Leu Asp Ile Ala Phe Leu Leu Tyr Phe Asn Asp Thr
                       230
                                           235
   His Lys Ser Ile Arg Lys Ala Lys Phe Leu Pro Arg Gly Met Glu Glu
                                      250
   Phe Met Glu Arg Glu Ser Leu Leu Arg Arg Thr Arg Gln Ala Asp Gly
                                   265
              260
  Ile Ser Ala Glu Val Thr Ala Ser Ser Ser Lys His Ser Gly Pro Glu
                               280
   Asn Asn Gln Cys Ser Leu His Pro Phe Gln Ile Ser Phe Arg Gln Leu
                          295
                                              300
Gly Trp Asp His Trp Ile Ile Ala Pro Pro Phe Tyr Thr Pro Asn Tyr
                      310
                                           315
Cys Lys Gly Thr Cys Leu Arg Val Leu Arg Asp Gly Leu Asn Ser Pro
(Ô
                   325
                                       330
   Asn His Ala Ile Ile Gln Asn Leu Ile Asn Gln Leu Val Asp Gln Ser
               340
                                   345
   Val Pro Arg Pro Ser Cys Val Pro Tyr Lys Tyr Val Pro Ile Ser Val
          355
                              360
   Leu Met Ile Glu Ala Asn Gly Ser Ile Leu Tyr Lys Glu Tyr Glu Gly
                          375
📮 Met Ile Ala Glu Ser Cys Thr Cys Arg
∔ 385
                       390
   <210> 35
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   <213> HOMO SAPIEN
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   Pro Met Arg Lys His Val Leu Ala Ala Ser Phe Ser Met Leu Ser Leu
                                       10
   Leu Val Ile Met Gly Asp Thr Asp Ser Lys Thr Asp Ser Ser Phe Ile
                                   25
   Met Asp Ser Asp Pro Arg Arg Cys Met Arg His His Tyr Val Asp Ser
                              40
   Ile Ser His Pro Leu Tyr Lys Cys Ser Ser Lys Met Val Leu Leu Ala
                                              60
   Arg Cys Glu Gly His Cys Ser Gln Ala Ser Arg Ser Glu Pro Leu Val
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Ser Phe Ser Thr Val Leu Lys Gln Pro Phe Arg Ser Ser Cys His Cys
   Cys Arg Pro Gln Thr Ser Lys Leu Lys Ala Leu Arg Leu Arg Cys Ser
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                                   105
   Gly Gly Met Arg Leu Thr Ala Thr Tyr Arg Tyr Ile Leu Ser Cys His
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   Cys Glu Glu Cys Asn Ser
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   Leu Leu Ala Leu Leu Pro Ser Leu Pro Leu Thr Arg Ala Pro Val
                                   25
   Pro Pro Gly Pro Ala Ala Ala Leu Leu Gln Ala Leu Gly Leu Arg Asp
                               40
  Glu Pro Gln Gly Ala Pro Arg Leu Arg Pro Val Pro Pro Val Met Trp
                           55
  Arg Leu Phe Arg Arg Arg Asp Pro Gln Glu Thr Arg Ser Gly Ser Arg
                      70
                                          75
   Arg Thr Ser Pro Gly Val Thr Leu Gln Pro Cys His Val Glu Leu
                  85
                                       90
  Gly Val Ala Gly Asn Ile Val Arg His Ile Pro Asp Arg Gly Ala Pro
              100
                                   105
                                                       110
   Thr Arg Ala Ser Glu Pro Val Ser Ala Ala Gly His Cys Pro Glu Trp
                               120
   Thr Val Val Phe Asp Leu Ser Ala Val Glu Pro Ala Glu Arg Pro Ser
                           135
                                              140
  Arg Ala Arg Leu Glu Leu Arg Phe Ala Ala Ala Ala Ala Ala Pro
                      150
                                          155
Glu Gly Gly Trp Glu Leu Ser Val Ala Gln Ala Gly Gln Gly Ala Gly
                  165
                                       170
🕌 Ala Asp Pro Gly Pro Val Leu Leu Arg Gln Leu Val Pro Ala Leu Gly
                                   185
   Pro Pro Val Arg Ala Glu Leu Leu Gly Ala Ala Trp Ala Arg Asn Ala
                              200
                                                  205
   Ser Trp Pro Arg Ser Leu Arg Leu Ala Leu Ala Leu Arg Pro Arg Ala
                           215
                                               220
   Pro Ala Ala Cys Ala Arg Leu Ala Glu Ala Ser Leu Leu Val Thr
                       230
                                           235
   Leu Asp Pro Arg Leu Cys His Pro Leu Ala Arg Pro Arg Arg Asp Ala
                                       250
   Glu Pro Val Leu Gly Gly Gly Pro Gly Gly Ala Cys Arg Ala Arg Arg
              260
                                   265
   Leu Tyr Val Ser Phe Arg Glu Val Gly Trp His Arg Trp Val Ile Ala
                               280
   Pro Arg Gly Phe Leu Ala Asn Tyr Cys Gln Gly Gln Cys Ala Leu Pro
                           295
                                              300
   Val Ala Leu Ser Gly Ser Gly Gly Pro Pro Ala Leu Asn His Ala Val
                       310
                                           315
```

Leu Arg Ala Leu Met His Ala Ala Pro Gly Ala Ala Asp Leu Pro

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325
                                     330
Cys Cys Val Pro Ala Arg Leu Ser Pro Ile Ser Val Leu Phe Phe Asp
                                 345
Asn Ser Asp Asn Val Val Leu Arg Gln Tyr Glu Asp Met Val Val Asp
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                             360
Glu Cys Gly Cys Arg
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Trp Leu Asp Leu Glu Phe Ile Cys Thr Val Leu Gly Ala Pro Asp Leu
Gly Gln Arg Pro Gln Gly Ser Arg Pro Gly Leu Ala Lys Ala Glu Ala
Lys Glu Arg Pro Pro Leu Ala Arg Asn Val Phe Arg Pro Gly Gly His
                         55
Ser Tyr Gly Gly Gly Ala Thr Asn Ala Asn Ala Arg Ala Lys Gly Gly
                                         75
Thr Gly Gln Thr Gly Gly Leu Thr Gln Pro Lys Lys Asp Glu Pro Lys
                8.5
                                     90
Lys Leu Pro Pro Arg Pro Gly Gly Pro Glu Pro Lys Pro Gly His Pro
                                 105
Pro Gln Thr Arg Gln Ala Thr Ala Arg Thr Val Thr Pro Lys Gly Gln
                             120
Leu Pro Gly Gly Lys Ala Pro Pro Lys Ala Gly Ser Val Pro Ser Ser
                         135
                                             140
Phe Leu Leu Lys Lys Ala Arg Glu Pro Gly Pro Pro Arg Glu Pro Lys
                    150
                                         155
Glu Pro Phe Arg Pro Pro Pro Ile Thr Pro His Glu Tyr Met Leu Ser
                                     170
                165
Leu Tyr Arg Thr Leu Ser Asp Ala Asp Arg Lys Gly Gly Asn Ser Ser
                                 185
Val Lys Leu Glu Ala Gly Leu Ala Asn Thr Ile Thr Ser Phe Ile Asp
                            200
Lys Gly Gln Asp Asp Arg Gly Pro Val Val Arg Lys Gln Arg Tyr Val
                         215
Phe Asp Ile Ser Ala Leu Glu Lys Asp Gly Leu Leu Gly Ala Glu Leu
                    230
                                         235
Arg Ile Leu Arg Lys Lys Pro Ser Asp Thr Ala Lys Pro Ala Val Pro
                                     250
Arg Ser Arg Arg Ala Ala Gln Leu Lys Leu Ser Ser Cys Pro Ser Gly
                                 265
Arg Gln Pro Ala Ala Leu Leu Asp Val Arg Ser Val Pro Gly Leu Asp
                             280
Gly Ser Gly Trp Glu Val Phe Asp Ile Trp Lys Leu Phe Arg Asn Phe
                         295
                                             300
Lys Asn Ser Ala Gln Leu Cys Leu Glu Leu Glu Ala Trp Glu Arg Gly
                    310
                                         315
Arg Thr Val Asp Leu Arg Gly Leu Gly Phe Asp Arg Ala Ala Arg Gln
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Val His Glu Lys Ala Leu Phe Leu Val Phe Gly Arg Thr Lys Lys Arg
Asp Leu Phe Phe Asn Glu Ile Lys Ala Arg Ser Gly Gln Asp Asp Lys
                            360
Thr Val Tyr Glu Tyr Leu Phe Ser Gln Arg Arg Lys Arg Arg Ala Pro
                        375
Ser Ala Thr Arg Gln Gly Lys Arg Pro Ser Lys Asn Leu Lys Ala Arg
                    390
                                        395
Cys Ser Arg Lys Ala Leu His Val Asn Phe Lys Asp Met Gly Trp Asp
                405
                                    410
Asp Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Phe His Cys Glu Gly
            420
                                425
                                                    430
Leu Cys Glu Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala
                            440
Val Ile Gln Thr Leu Met Asn Ser Met Asp Pro Glu Ser Thr Pro Pro
                        455
Thr Cys Cys Val Pro Thr Arg Leu Ser Pro Ile Ser Ile Leu Phe Ile
                    470
                                        475
Asp Ser Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val
                485
                                   490
Glu Ser Cys Gly Cys Arq
            500
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Ile Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu
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Asn Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn
                            40
Thr Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys
                        55
Leu Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Val Ile Arg Gln
                    70
                                        75
Leu Leu Pro Lys Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp
                85
                                    90
Val Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr
                                105
His Ala Thr Thr Glu Thr Ile Ile Thr Met Pro Thr Glu Ser Asp Phe
                            120
Leu Met Gln Val Asp Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser
                        135
                                            140
Ser Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr
                    150
                                        155
Leu Arg Pro Val Glu Thr Pro Thr Thr Val Phe Val Gln Ile Leu Arg
                                    170
Leu Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser
            180
                                185
                                                    190
Leu Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp
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200 Val Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu

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215
Gly Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val
                    230
                                        235
Thr Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val
                245
                                    250
Lys Val Thr Asp Thr Pro Lys Arg Ser Arg Asp Phe Gly Leu Asp
                                265
           260
Cys Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr
                            280
Val Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg
                       295
                                            300
Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln
                    310
                                        315
Lys Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser
                325
                                    330
Ala Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu
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           340
Tyr Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met
Val Val Asp Arg Cys Gly Cys Ser
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Trp Leu Cys Phe Pro Ile Ser Leu Gly Ser Gln Ala Ser Gly Glu Glu Ala Gln Ile Ala Ala Ser Ala Glu Leu Glu Ser Gly Ala Met Pro Trp 40 Ser Leu Leu Gln His Ile Asp Glu Arg Asp Arg Ala Gly Leu Leu Pro 55 Ala Leu Phe Lys Val Leu Ser Val Gly Arg Gly Gly Ser Pro Arg Leu 70 Gln Pro Asp Ser Arg Ala Leu His Tyr Met Lys Lys Leu Tyr Lys Thr 90 Tyr Ala Thr Lys Glu Gly Ile Pro Lys Ser Asn Arg Ser His Leu Tyr 105 Asn Thr Val Arg Leu Phe Thr Pro Cys Thr Arg His Lys Gln Ala Pro 120 125 Gly Asp Gln Val Thr Gly Ile Leu Pro Ser Val Glu Leu Leu Phe Asn 135 140 Leu Asp Arg Ile Thr Thr Val Glu His Leu Leu Lys Ser Val Leu Leu 150 Tyr Asn Ile Asn Asn Ser Val Ser Phe Ser Ser Ala Val Lys Cys Val 170 165 Cys Asn Leu Met Ile Lys Glu Pro Lys Ser Ser Ser Arg Thr Leu Gly 180 185 Arg Ala Pro Tyr Ser Phe Thr Phe Asn Ser Gln Phe Glu Phe Gly Lys 200 Lys His Lys Trp Ile Gln Ile Asp Val Thr Ser Leu Leu Gln Pro Leu 215

Val Ala Ser Asn Lys Arg Ser Ile His Met Ser Ile Asn Phe Thr Cys 225 230 235 Met Lys Asp Gln Leu Glu His Pro Ser Ala Gln Asn Gly Leu Phe Asn 245 250 Met Thr Leu Val Ser Pro Ser Leu Ile Leu Tyr Leu Asn Asp Thr Ser 260 265 Ala Gln Ala Tyr His Ser Trp Tyr Ser Leu His Tyr Lys Arg Arg Pro 280 Ser Gln Gly Pro Asp Gln Glu Arg Ser Leu Ser Ala Tyr Pro Val Gly 295 300 Glu Glu Ala Ala Glu Asp Gly Arg Ser Ser His His Arg His Arg Arg 310 315 Gly Gln Glu Thr Val Ser Ser Glu Leu Lys Lys Pro Leu Gly Pro Ala 325 330 Ser Phe Asn Leu Ser Glu Tyr Phe Arg Gln Phe Leu Leu Pro Gln Asn 340 345 Glu Cys Glu Leu His Asp Phe Arg Leu Ser Phe Ser Gln Leu Lys Trp 360 Asp Asn Trp Ile Val Ala Pro His Arg Tyr Asn Pro Arg Tyr Cys Lys 375 380 Gly Asp Cys Pro Arg Ala Val Gly His Arg Tyr Gly Ser Pro Val His 390 395 Thr Met Val Gln Asn Ile Ile Tyr Glu Lys Leu Asp Ser Ser Val Pro 405 410 Arg Pro Ser Cys Val Pro Ala Lys Tyr Ser Pro Leu Ser Val Leu Thr 420 425 Ile Glu Pro Asp Gly Ser Ile Ala Tyr Lys Glu Tyr Glu Asp Met Ile 435 440 Ala Thr Lys Cys Thr Cys Arg (Q <210> 40 <211> 238 <212> PRT <213> HOMO SAPIEN **Q** <400> 40 💾 Pro Met Pro Gly Leu Ile Ser Ala Arg Gly Gln Pro Leu Leu Glu Val Leu Pro Pro Gln Ala His Leu Gly Ala Leu Phe Leu Pro Glu Ala Pro 20 25 Leu Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu 40 Ala Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg 55 60 Ser Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala Gly His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala 90 Arg Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala 105 Pro Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly 120 125 Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg 135 Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp





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145					150					155					160
Glu	Leu	Val	Arg	Phe 165	Arg	Phe	Cys	Ser	Gly 170	Ser	Cys	Arg	Arg	Ala 175	Arg
Ser	Pro	His	Asp 180	Leu	Ser	Leu	Ala	Ser 185	Leu	Leu	Gly	Ala	Gly 190	Ala	Leu
Arg	Pro	Pro 195	Pro	Gly	Ser	Arg	Pro 200	Val	Ser	Gln	Pro	Cys 205	Cys	Arg	Pro
Thr	Arg 210	Tyr	Glu	Ala	Val	Ser 215	Phe	Met	Asp	Val	Asn 220	Ser	Thr	Trp	Arg
Thr 225	Val	Asp	Arg	Leu	Ser 230	Ala	Thr	Ala	Cys	Gly 235	Cys	Leu	Gly		
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Arg Tyr Thr Asp Val Ala Phe Leu Asp Asp Arg His Arg
130 135 140

Leu Pro Gln Leu Ser Ala Ala Ala Cys Gly Cys Gly Gly
145 150 155